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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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BINGHAM, MCCUTCHEN LLP
THREE EMBARCADERO CENTER
18 FLOOR
SAN FRANCISCO, CA 94111-4067

EXAMINER

LEE, PING

ART UNIT PAPER NUMBER

2644

DATE MAILED: 12/29/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/812,718

Applicant(s)

TAENZER, JON C.

Examiner

Ping Lee

Art Unit

2644

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 September 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 17-52 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 17-52 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 23 September 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☐ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 9/23/05, 8/30/04.
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: _____.

DETAILED ACTION

Drawings

1. The drawing of Fig. 25 was received on 9/23/05. It is acceptable.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 17-52 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

The newly amended claims 17 and 23 and the newly added claim 36 have limitations which is not supported by the specification and the drawings as originally filed. Claim 17 specifies two amended steps of "determining a difference between amplitudes of signals respectively produced by the first and second sensors; adjusting the amplitudes of the signals based on the determined amplitude difference to produce adjusted signals". Claims 23 and 36 have similar limitation. Fig. 8 shows that the signals are adjusted by the ratio between one channel and the sum (power ratio control), not the difference between one channel and the other channel as claimed. In

Fig. 9, "L/S" and "R/S" have been used for adjusting the signals from the microphones.

"L/S" and "R/S" are ratios between one channel and the sum, not the difference as claimed. Figs. 10, 11, 22 and 23 have the similar layout. On p. 6 of the specification, the power ratio has been fully disclosed as the ratio between left power signal over the sum of the left and right power signals, and ratio between the right power signal over the sum of the left and right power signals. The disclosed ratio is different from the difference as claimed. Claim 36 also specifies the step of "determining a phase correction value based on the signal amplitude difference". Since none the drawings and the specification as originally filed shows how to determine the difference between the amplitudes of the signals respectively produced by the first and second sensors, this limitation also introduces new matter.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 17, 19-21, 23, 25-27, 36, 46 and 47 are rejected under 35 U.S.C. 102(b) as being anticipated by Welker et al ("Microphone-Array Hearing Aids with Binaural Output -Part II: A Two-Microphone Adaptive System").

In view of 112, 1st paragraph rejection above, the claims have been rejected under the broadest interpretation.

Regarding claims 17, 19, 20, 23, 25 and 26, Welker et al (hereafter Welker) disclose a method of achieving directional pickup of sound signal and a corresponding apparatus for implementing the method. Welker shows the first and second sensors (mL, mR), processing circuitry configured for determining a difference (the subtractor as shown in upper left portion of Fig. 2) between the amplitudes of signals respectively produced by the first and second sensors (see Fig. 1), for adjusting the amplitudes of the signals to produce adjusted signals ((adders or multipliers as shown); and for summing together to produce a directional signal (the two adder as shown in Fig. 1).

Regarding claims 21, 27, 36, 46 and 47, Greenberg shows the phase correction value for each band (the delay in Fig. 1 for low frequency and the delay in Fig. 2 for high frequency).

Claim Rejections - 35 USC § 103

6. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

7. Claims 17, 18, 23, 24, 36, 42-45 and 49-52, are rejected under 35 U.S.C. 103(a) as being unpatentable over Klootsema et al (US 6,697,494).

In view of 112, 1st paragraph rejection above, the claims have been rejected under the broadest interpretation.

Regarding claims 17, 18, 23, 24, 36, 43-45 and 49-52, Klootsema et al (hereafter Klootsema) disclose an apparatus and a corresponding method for achieving directional pickup of sound comprising a first and second sensors (3a,3b) and means for summing

together the signals to produce a directional signal (11); wherein the signals to be added are of approximately equal magnitude (see abstract). Klotsema teaches amplitude adjusting for one microphone signal (p in 8), but fails to show means for adjusting amplitudes of signals produced by the first and second sensors to produce adjusted signals. The idea of adjusting the amplitude, as taught in Klotsema, is to match the levels of the two microphone signals. This goal could be achieved by adjusting one signal path (Klotsema teaches that) or by adjusting two signal paths. By providing two separate adjustments for two inputs, the number of shifting performed by unit 8 could be reduced even when the two inputs have a huge level difference. Thus, it would have been obvious to one of ordinary skill in the art to modify Klotsema by providing means for adjusting the signals produced by the two sensors in order to speed up the processing.

Although Klotsema fails to explicitly show how to determine the difference, the idea of adjusting the amplitude and time delay, as taught in Klotsema, is to match the levels and phase of the two microphone signals. Without finding the difference, one could not determine how to and how much adjustment is needed. Thus, it would have been obvious to one of ordinary skill in the art to modify Klotsema by finding the difference between the signals from the two microphones in order to properly adjusting the amplitudes and phase of the microphones.

Regarding claim 42, although Klotsema fails to explicitly show how to determine the phase correction value, Klotsema teaches the purpose of equalizing the left and right signals. Thus, it would have been obvious to one of ordinary skill in the art to

modify Klootsema by using predetermined delay value organized in a table form based on the determined difference in order to accurately adjusting the microphone signals.

8. Claims 21, 22, 27 and 28, 37, 48 are rejected under 35 U.S.C. 103(a) as being unpatentable over Klootsema as applied to claims 17 and 23, 36 above, and further in view of Brennan et al (US 6,240,192).

In view of 112, 1st paragraph rejection above, the claims have been rejected under the broadest interpretation.

Regarding claims 21 and 27, 37, 38, Klootsema teaches phase correction value (z), but fails to show the phase correction value for each of multiple frequency bands. Brennan teaches that amplitude and phase corrections could be performed for multiple frequency bands individually in order to provide flexible processing. Thus, it would have been obvious to one of ordinary skill in the art to modify Klootsema in view of Brennan by separately correct the phase in multiple frequency bands in order to more accurately and efficiently generated the signal for a hearing aid.

Regarding claims 27 and 28, although Klootsema fails to show how to derive the phase correct value, the phase correction value inherently represents the difference between the signals from first and second sensors. Therefore, it would have been obvious to one of ordinary skill in the art to derive phase correction value for each frequency band by finding the difference between the signals from first and second sensors in each band.

Response to Arguments

9. Applicant's arguments filed 9/23/05 have been fully considered but they are not persuasive.

The argument is based on the claimed limitation that a difference between the microphone signals is determined. However, this limitation introduced new matter. Therefore, claims 17-52 are rejected under 112, 1st paragraph rejection and the argument is moot.

Conclusion

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

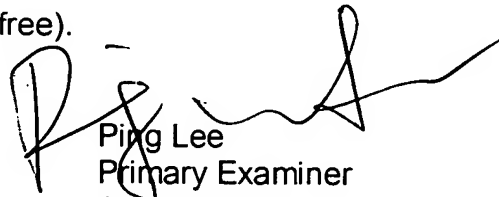
A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ping Lee whose telephone number is 571-272-7522.

The examiner can normally be reached on Monday and Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vivian C. Chin can be reached on 571-272-7848. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Ping Lee
Primary Examiner
Art Unit 2644

pwl